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Laparoscopic Surgical Approach for Cecocutaneous Fistula in a Patient after Open Appendicectomy

Himanshu Shekhar[1*], Prasanna Kumar Reddy[2], T. G. Balachandar[3] and Raghavendra[3]

[1]Department of Minimal Access Surgery, Apollo Hospitals, Chennai, India.
[2]Department of Minimal Access Surgery and Surgical Gastroenterology, Apollo Hospitals, Chennai, India.
[3]Department of Surgical Gastroenterology, Apollo Hospitals, Chennai, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Appendicectomy is among the most commonly performed emergency surgical procedure worldwide for acute appendicitis. Cecocutaneous fistula post appendicectomy is a rare complication after appendicectomy. Management of enterocutaneous fistula is variable and depends upon fistula output, location, duration of disease, patient factors, etc. Traditional surgical management requires laparotomy with bowel resection and anastomosis. Nowadays laparoscopy has become an alternative and suitable surgical management for complex problems. Here, we report a 43 years old male presented with watery and feculent discharge from a previous appendicectomy scar. Contrast enhanced Computerized Tomography (CT) Scan of abdomen demonstrated a cecocutaneous fistula. The patient was having a low output, matured fistula, and underwent laparoscopic fistula excision with stapler wedge resection of involved bowel.
Histopathological findings of the resected specimen were consistent with chronic inflammatory fistula.

**Corresponding author: E-mail: himanshushekhar434@gmail.com;*

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1. INTRODUCTION

Appendicitis remains the most common gastrointestinal surgical emergency in adults and appendicectomy is one of the most commonly performed emergency surgical procedures [1,2]. The main risk factors associated with post-operative complications are female gender, necrotic or perforated appendicitis, and cavity drainage [3] commonest complications after appendicectomy are Intra-abdominal abscess (65%), wound infections (24%), and sepsis (21%) whereas appendicocutaneous fistula post appendicectomy is very rare with an incidence of (0.133%) still it accounts for up to 10% of morbidity caused post appendicectomy [4]. Surgical resection of enterocutaneous fistula mostly involves excision of the fistulous tract with segmental resection of the involved bowel [5]. Here we present a case report of 43 years old man who presented with post appendicectomy ceacocutaneous fistula. Our patient was having a low output mature fistula without any underlying bowel pathology and was managed by laparoscopic fistulectomy with stapler wedge excision of involved bowel.

2. CASE PRESENTATION

A 43 years old male presented with complaining of watery, feculent discharge from an open appendicectomy scar site for 9 months. Discharging sinus was associated with continuous, mild, dull aching abdominal pain in the right iliac fossa. The patient did not give a history of any fever, alteration bowel movement, or weight loss. The patient had no comorbidities. Detailed history revealed the patient had the first episode of severe pain in the right lower abdomen, diagnosed as acute appendicitis for which he underwent emergency open appendicectomy in January 2020 at a local hospital. He was apparently well for 4 months after surgery when he developed abdominal pain with fecopurulent discharge around the surgical site. The patient underwent exploratory laparotomy at a local hospital where an abscess around the ceacum was found and drainage & debridement was done on 16 May 2020. Symptoms of pain and inflammation subsided after surgery, but the patient continued to have a fecopurulent discharge from the surgical scar site. Multiple blood investigations between June 2020 to November 2020 were persistent with elevated Total leucocyte count and raised ESR. Ultrasound of abdomen done on 23 June 2020 was showing an intraperitoneal collection in RIF with fistula formation. X-ray sinogram done on 5/10/2020 was consistent with fistula tract in the anterior abdominal wall over RIF with communication within the peritoneal cavity. The patient consulted at multiple local hospitals during this period and was managed conservatively. The patient presented to us in February 2021 with the above-mentioned complaints.

Examination of his abdomen revealed 2 open surgical scars. One grid iron incision and another vertical mid-line incision. Fistula opening was seen at the medial end of grid iron incision. The surrounding skin was without any signs of inflammation.

His abdomen was soft and non distended without any tenderness or guarding. Biochemical investigations were unremarkable. A contrast-enhanced CT scan of the abdomen was done which revealed two ill-defined fistulous tracts with their external openings noted in the skin of the right iliac fossa. These two tracts were seen coursing in both subcutaneous plane and inter-muscular planes and seen intercommunicating with each other. A branching tract was seen arising from the middle portion of the inter-communicating area between the above mentioned two tracts which were seen further coursing medially in an inter-muscular plane and extending intra-peritoneally and ending blindly adjacent to the caecum and closely abutting it (Fig. 1).

Colonoscopy did not show any mass lesion. No features of inflammatory bowel disease were found. The culture of fluid was not sent because of obvious fecal discharge and the absence of any active inflammatory features surrounding the fistula.

The patient was admitted for a definitive procedure as there were no active signs of sepsis and the patient was fit. The patient was put under general anesthesia. As the patient had two open surgical scars in midline and right lower abdomen, pneumoperitoneum was created by veress needle insertion at palmer's point. 10mm port was inserted at palmers point for laparoscope. Two 5mm working ports were inserted. 1st at right midclavicular line a little

above the level of umbilicus and 2nd at suprapubic area. Caecum along with another bowel loop was found adhered to the abdominal wall (Fig. 2). On freeing the caecum from the abdominal wall, a granulation tissue-lined matured fistula track was found (marked B in Fig. 2). The fistula was dissected from the abdominal wall to the peritoneal level. Right midclavicular port was converted to 12mm port for stapler use. Caecum was secured with holding suture, and the fistula was excised along with wedge resection of surrounding bowel by firing 60 green staplers (Echelon Flex TM, Ethicon Inc., Somerville, NJ, USA) (Fig. 3). The fistula opening over the skin was cauterized. The specimen was sent for histopathological analysis. Overall histopathology was consistent with chronic inflammatory fistula.

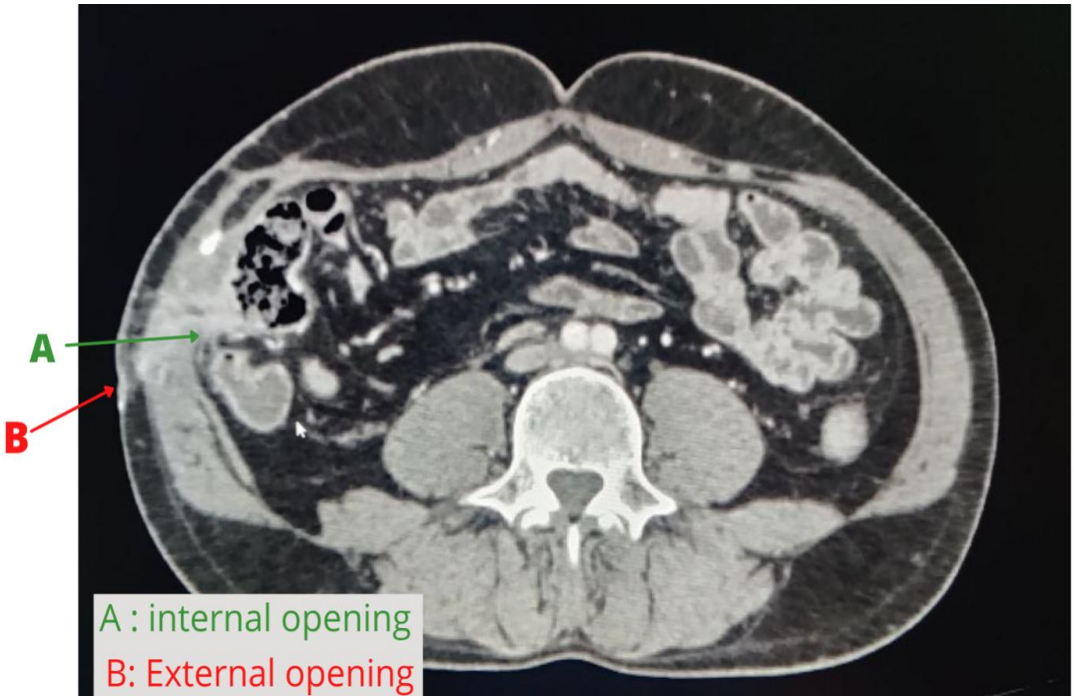

Fig. 1. CECT abdomen revealing fistula tract communicating from ceacum to skin

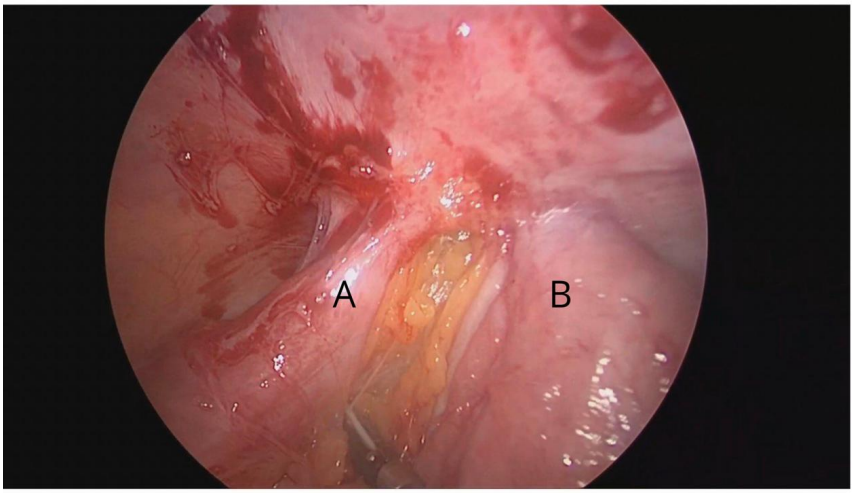

Fig. 2. Two bowel loops adhered to abdominal wall. Loop B is communicating with fistula tract

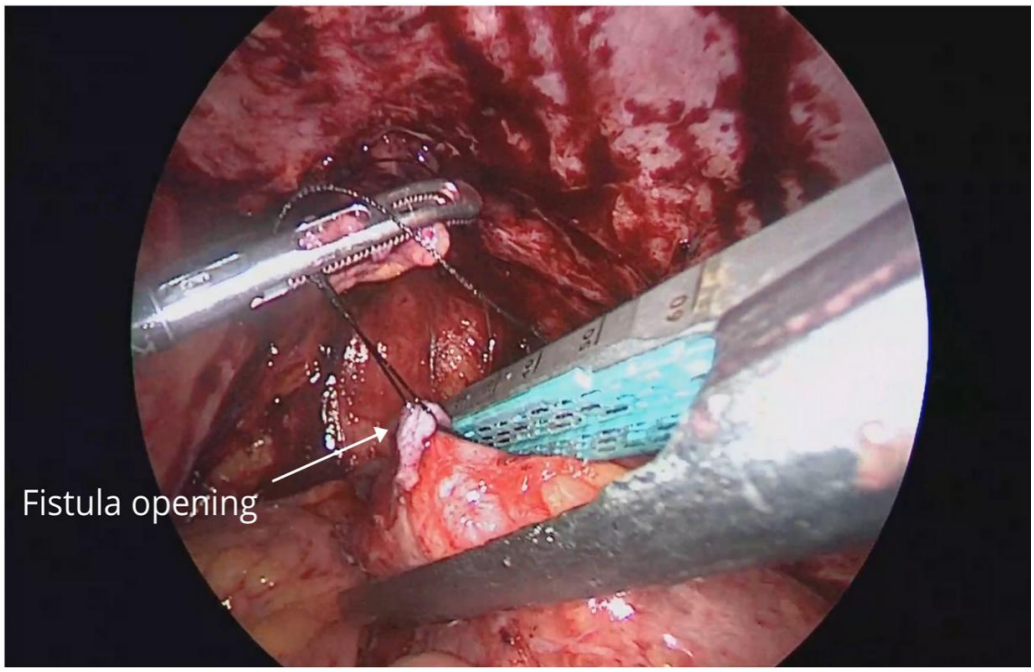

Fig. 3. Bowel containing fistula tract is being excised with wedge resection of surrounding bowel by green Echelon 60 stapler

The postoperative period was uneventful and the patient was discharged on the second post-operative day. The patient had no complications on subsequent follow-ups done telephonically till 5 months post discharge.

3. DISCUSSION

Enterocutaneous fistula is defined as an abnormal communication between bowel and skin. Post appendicectomy enterocutaneous fistula is rare but significant as it causes devastating morbidity and productivity loss. Major etiological factors contributing to post appendicectomy fistula are appendiceal stump leakage, neoplasm of appendix and caecum, distal obstruction, inflammatory bowel disease, and infective bowel conditions (e.g. tuberculosis, actinomycosis). Other etiological factors contributing to post appendicectomy fecal fistulae are severe periappendicitis involving the base of a cecal wall, appendicular perforation, stump appendicitis, and injury to the cecum during an appendectomy [2,6,7].

Our patient underwent open appendicectomy for acute appendicitis at a local hospital. 4 months post surgery he developed periappendicular abscess with appendicocutaneous fistula for which open exploration and debridement of abscess cavity was done at a local hospital. Most commonly post appendicectomy stump leakage occurs either due to long stump producing recurrence or inadequate closure contaminating abdominal cavity with fecal material. Two methods of stump closure are commonly used in open appendicectomy. These are simple ligation and stump invagination. Historically stump ligation was considered inadequate as it was thought that stump invagination prevents adhesions by seroserosal healing and also prevents stump blowout especially when the base is unhealthy by containing it inside the lumen, but recent metaanalysis suggested that there is no advantage of stump invagination over simple ligation in preventing postoperative infective complications. Stump invagination is also associated with prolonged postoperative paralytic ileus within the 1st 72 hours. Additionally it can produce peculiar complications such as intramural abscesses, erosion of the cecal wall, compromised blood supply and local ischemia leading to fistula formation. Also in the long-term it can simulate a cecal polyp on radiological imaging leading to unnecessary invasive investigations to rule out malignancy [8,9]. As technical details of surgery was not available in the documents available with our patient, probable cause of stump dehiscence leading to fistula formation could not be identified. Also in

the long-term it can simulate a cecal polyp on radiological imaging leading to unnecessary invasive investigations to rule out malignancy.

The management of enterocutaneous fistula is done in a stepwise fashion. The five steps progressively are identification and stabilization of patient, investigation to know type and characteristics of fistula, decision making for conservative or surgical management, definitive surgical procedure, and promotion of healing [5].

Nonsurgical management options include: Vacuum assisted closure (VAC), fistuloscopy with fibrin glue obturation, treatment of underlying disease. (Eg. Monoclonal antibody in patients with Crohn's disease). Endoscopically deployable stents, endoscopic suturing devices, through the scope, and over the scope clips are the endoscopic management options [2,10]. Stem cells have been proposed as a theoretically minimally invasive treatment for some types of entecutaneous fistula [8]. Mesenchymal stem cell therapys have been proposed as a theoretically minimally invasive treatment for some types of entecutaneous fistula. Cultured (expanded) adipose derived mesenchymal stem cells (ASCs) were found to successfully close the Crohn's enterocutaneous fistula in 3 out of 4 patients as compared to closure in 1 out of 4 patients when treated with ASCs without expansion in a study by Damian Garcia et al. [11]. Further research is going to find out the role of stem cell derived extracellular vesicles in treatment of enterocutaneous fistula as these represent a cell free alternative in regenerative medicine to promote tissue healing. Arthur Berger and associates found in their research that local administration of stem cell derives extracellular vesicles applied in a thermoresponsive hydrogel matrix on surgically created colocutaneous fistula, it significantly decreased the fistula output and external orifice diameter in rats [12].

Surgical management of fistula should be considered only after inflammation has subsided preferably after 4-6 weeks. Our patient presented to us 9 months after the onset of symptoms of enterocutaneous fistula and was having a low output fistula without any active inflammation and with an optimal nutritional status hence taken for surgical treatment. Post appendectomy high output /complex fistula/fistula with a suspicious neoplasm or underlying bowel pathology like Crohn's disease patient may need laparotomy with segmental resection of diseased bowel. As our patient had matured fistula and underlying bowel pathologies were excluded by preoperative workup, he underwent laparoscopic fistula tract excision with stapled wedge resection of involved bowel.

4. CONCLUSION

Post appendicectomy cecocutaneous fistula is a rare complication of appendicectomy. Enterocutaneous fistula management depends upon the stage of disease, output, location, patient factors, and underlying disease pathology. Surgical management mostly involves open surgery with fistula tract excision and segmental resection of the bowel but surgical management by laparoscopic approach is also feasible in selected cases. A laparoscopic approach to enterocutaneous fistula is both safe and technically feasible. In expert hands, the results of the laparoscopic approach are equivalent to that of open surgery. The minimal invasive approach reduces the post-operative in-hospital stay, decreases post-operative pain, and causes an early return to work hence decreasing productivity loss due to the disease.

CONSENT AND ETHICAL APPROVAL

As per university standard guideline, participant consent and ethical approval have been collected and preserved by the authors

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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